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soil conservation

DEVOTED TO THE WISE USE OF LAND AND WATER RESOURCES

CONSERVATION AND ECONOMIC GROWTH

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SOIL CONSERVATION SERVICE
U. S. DEPARTMENT OF AGRICULTURE

December 1968 Vol. 34, No. 5

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DEVOTED TO THE WISE USE OF LAND AND WATER RESOURCES

COVER: Fishermen and campers swarmed to the Tribble Fork Dam in the American Fork-Dry Creek Watershed Project in Utah on opening day of fishing season at the multipurpose reservoir.

Payoff . . .

Conservation is no exception to the truism that "results count."

No amount of altruism and wishful thinking will substitute for visible returns in motivating landowners and community leaders to practice conservation.

Happily, the payoff is evident in every operating conservation district and watershed or RC&D project, as the examples reported in this issue of *Soil Conservation* show.

Self-starting: Word of notable industrial development in a remote rural area of southwestern Oklahoma led us to send SCS writer Walter Allen to see what was happening. His account (p. 99) makes clear that economic growth needn't wait on outside stimulus. Local leaders who saw the potentials of local resources and told the story to industrial management brought a needed balance to a rural economy.

TAP: Similar enthusiasm generated by the Technical Action Panel in a Michigan community gives cause for the optimism reported by SCSer Martin Kangas (p. 101). In this case, a regional framework plan developed by district leaders helped identify local resources for attention.

RC&D: More formalized programs in resource conservation and development projects give added drive to measures that bolster local economy. ERS Economist Dwight Gadsby, at our request, explains how the multiple benefits of these projects are evaluated (p. 105).

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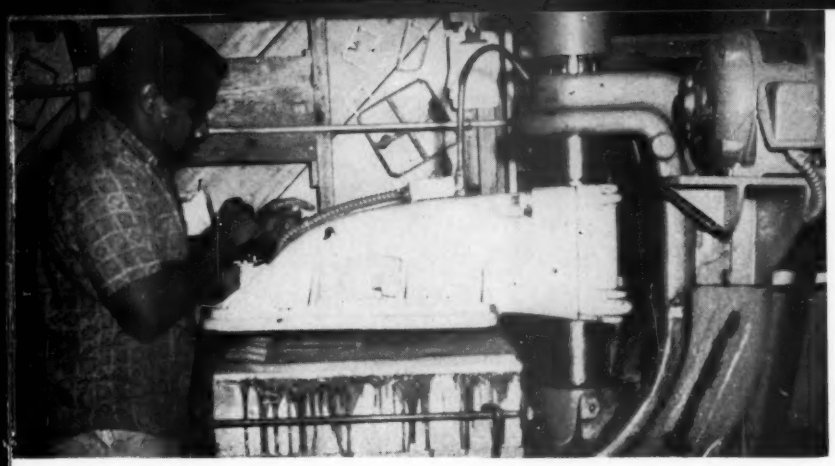


Industry: Take notice!

Oklahoma community uses quality labor and space to balance farm economy

A wheat-and-cotton community in southwestern Oklahoma has done what hundreds of other communities in America are talking about.

It has taken a lot of the ups-and-downs out of its economy.

No longer is there a steady outflow of people.

Small farmers are no longer selling out, either to big farmers or to other small farmers who found themselves with holdings too small for a living from farming alone.

A new order

And downtown the merchants report a new order of business, a stability unknown before.

The area—Tillman County, with Frederick its seat of government—has attracted industry to the point that everybody in the county who wants to work in one of the plants is working there.

Some workers are even commuting from surrounding counties.

And Paul McLellan, the man the local residents say is mainly responsible, says that if any new industries want to come to Frederick people will have to move into the county to work in them. That means growth, and Frederick's Chamber of Commerce, which from the beginning has given strong leadership to the upward push, is preparing for it.

Agriculture, of course, is still Tillman County's leading industry. The county is fifth in land in agriculture in the state. Wheat is its leading cash crop, with cotton second. Grain sorghums and alfalfa are becoming more important. The county leads in Oklahoma in the output of alfalfa seed. Interest in livestock—there are about 60,000 head of cattle, mostly beef, aside from those in feedlots—is growing.

Most of the county's 1,001 farmers are working on or have completed conservation farm plans. Woodrow Bohannan, chairman of the Tillman County Soil and Water Conservation District, estimates that conservation work done by the landowners is contributing $500,000 a year to the local economy.

Quality of labor

In the seven small industrial firms in Frederick there are 700 employees. Well over 600 of the employees are from farms. In many cases the farm wife, too, is employed in one of the plants.

The quality of labor was one of the factors attractive to the operators of the industrial plants in considering the area. The employees learn quickly the needed skills and are glad to have the chance at income which will mean they can keep their homes.

Space was another factor. Frederick had established an industrial park with ample room for expansion of facilities.

Access to markets was a third. Two railroads and a modern highway system serve the area.

The community began the effort to bring balance into its economy as long as 15 years ago.

"We knew we had to attract industry," explained McLellan, a Frederick resident from early childhood. "We decided first to find out what it would take to get it here."

A first step was a request by the Frederick Chamber of Commerce to the Agricultural-Industrial Service of Oklahoma State University at Stillwater for an area survey. The survey showed a top-heavy cash crop income with a low percentage from livestock. It also showed a need to improve school facilities and to provide for additional cultural and recreational advantages.

Frederick leaders promptly formed Frederick, Inc., an industrial foundation and set about to meet the conditions outlined in the survey. McLellan directs the foundation's affairs.

Soon industry started to take notice.

The second largest industrial employer to set up a plant in the new industrial park is a leather goods manufacturer. The firm employs 225 men and women at the local

Billfolds (right) produced at the leather goods firm may carry some of the new dollars in Tillman County's economy. New irrigation systems (left) like the one Ernest Hazel is discussing with Jack Bohl of SCS help keep agriculture strong.

plant and at a subsidiary in Tipton, a neighboring community in the county. The company has expanded twice and soon will add space for 50 additional workers.

Another company, manufacturing women's garments, started 5 years ago with 10,000 square feet of space and 25 workers. It has expanded four times and now has more than 135,000 square feet with 350 operators. It has an international market.

The newest arrival on the industrial scene is a firm which specializes in overhauling jet aircraft engines. It employs 90 workers now, and officials expect to increase the number to 250.

A stone-working firm employs 66 workers and uses 6,000 square feet of space. Its products are in national demand. Company heads say plans call for the production of structural stone soon.

A new garment factory has entered the field with 30 workers employed in an almost completely automated plant.

Two of the local industries are associated with agriculture. There are four feedlots with a total capacity of 18,000 head. One of the firms, on the highway east from Frederick, is the second-largest in Oklahoma and is still expanding. It now has a capacity of 15,000.

A new fertilizer and agricultural chemical firm operates a bulk fertilizer blending plant and ammonia storage and handling facilities.

The feedlots consume more feed than is raised in the county. The practice of soil and water conservation has encouraged the shift to pasture, forage production, and livestock as a more efficient use of the land resource. Irrigation from wells, with farmers using the technical skills of the Soil Conservation Service to develop conservation systems and do other conservation work, is claiming increasing interest.

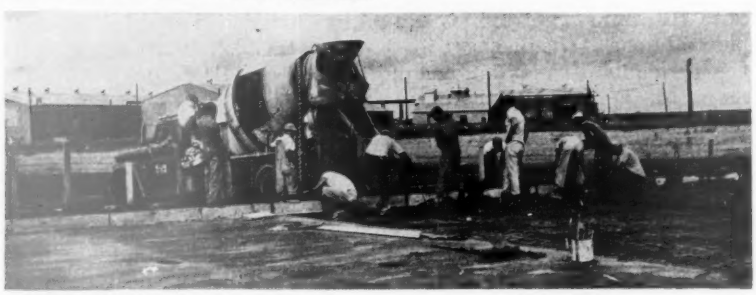
Laxton Malcolm, Tillman County's extension agent, says the average size of farms in the county has been growing over the years, reflecting the national trend. However, the rate of increase is considerably less now that landowners have access to additional income from industry. The average size of farms now is 500 acres. In 1945 the 2,081 farms averaged about 240 acres.

The movement of labor from the farms to the industrial plants has worked a degree of hardship on some of the farmers. However, the use of larger equipment has helped to solve the problem.

"What we have done hasn't all been roses," Bohannan, the soil conservation district board chairman, said. "But we have worked together. I don't know of any town our size that has moved ahead with such energy to attract industry. We are happy with our progress.

"The advantages of having industry here to balance our agricultural income far outweigh the disadvantages. Industry shares the tax load and as a result we have better schools, highways, and public facilities. I think we will find it has meant faster progress with our resource conservation work, too. ♦

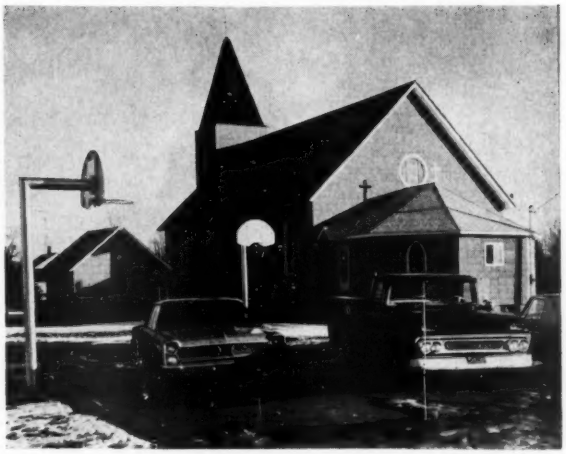
It's construction time again as a garment factory expands for the fourth time since it started in Tillman County 5 years ago.



A town of tomorrow—today

By Martin E. Kangas

Work unit conservationist, SCS, Ontonagon, Mich.



"Ewen is where the lucky ones live all year around."

You hear it said often today around this small Ontonagon County town in Michigan's Upper Peninsula.

But it wasn't always so. Young men once grew up saying, "Ewen is a good place to be from." They couldn't wait to leave for the cities of southern Michigan, Wisconsin, and Illinois.

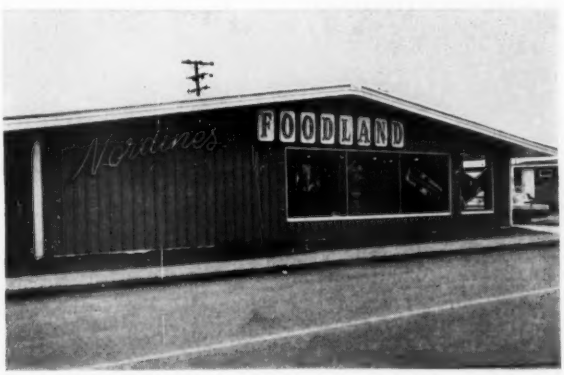
Yes, Ewen has changed. But no miracle occurred to make it so. No one struck gold. No new industry moved in to solve Ewen's economic problems. No generous benefactor came in to help the community. Only unlimited enthusiasm, progressive planning, hard work, and an optimistic attitude among its people are making Ewen what it is today—a better place to live. Members of the Ontonagon-Gogebic Technical Action Panel are giving a helping hand.

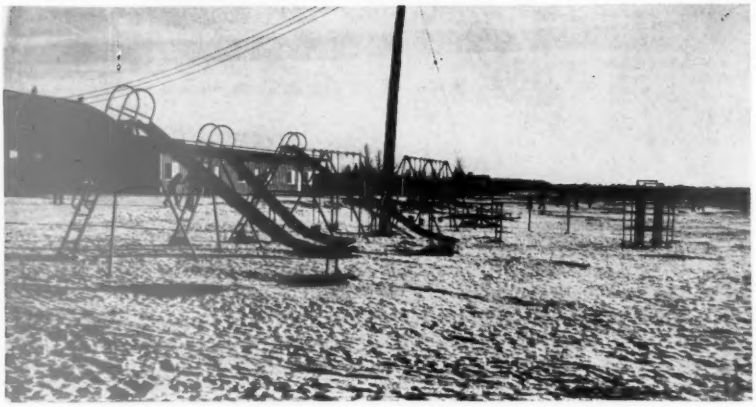
With a population of less than 500, Ewen has taken to rural areas development seriously. Its leaders want Ewen to be one of the new type of community needed in rural America—The Community of Tomorrow.

"We know we need a broad base in our development," said Gerald Hendrickson, president of the Ewen Businessmen's Association. "We need the combined resources of the entire area to make Ewen truly a Community of Tomorrow, not just a nice looking town in a rundown countryside."

Ewen, like most other rural towns, is dependent on the surrounding area for its existence. It needs its agriculture, its forest in-

Signs that Ewen is on the move: A market becomes "super" in a new building (below, left to right); and town, school, and church join to build a combination play area and parking lot (above).





This school playground, leveled and drained as a community project, doubles as a skating rink in winter.

dustries, its mining, and its recreation. Ewen's progressive leaders see the wisdom in a broad area approach to community development.

A framework program for the Copper Country Broad Program Area, developed jointly under the leadership of directors of the Ontonagon, Houghton-Keweenaw, and Baraga soil conservation districts (see *Soil Conservation*, January 1967), has been the guide and inspiration for villages and communities to plan resource developments.

"It has directed our efforts to build a community where our young people can be properly educated and trained for good jobs," said Joseph Strnad, township supervisor and chairman of the Ontonagon District. "For example, the framework program indicated that we can economically support an overnight trailer and camping ground. One is being developed. It further indicated that we must upgrade our buildings and improve public facilities if we expect to attract the young miners working the White Pine Copper Mine 30 miles away.

"A major beautification and home improvement program was begun last summer. Natural gas was made available, all major streets resurfaced, and new mercury lighting installed throughout the town. Dozens of lots were improved, buildings remodeled and repainted, and engineers were hired to develop a new sewer and water system.

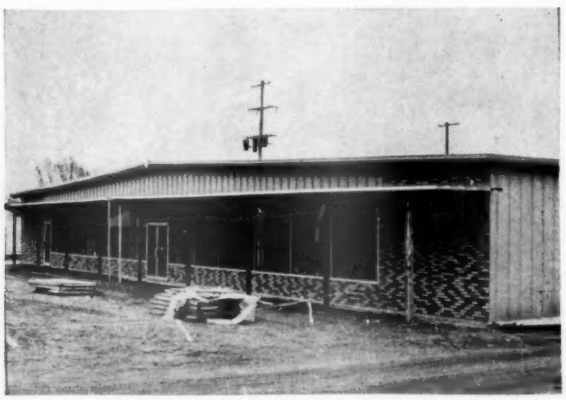
"The program showed us the need for medical and dental facilities. Plans are underway to build a clinic in Ewen. The land has been acquired and prepared for building. Financing is being arranged.

"We were also told that the surrounding area can support an additional 1,400 head of beef cattle. New farmers are buying farms, and established ones are increasing their herds. Improved market facilities are being planned," Strnad concluded.

Many other improvements are in progress or are nearing completion. Among these are better telephone service, street and sidewalk improvements, a new roadside park, a playground and skating rink. Farm home improvements, rural beautification, veterinary service, farm-based recreation, fee fishing, hunting, and fishing and canoeing guide service are all part of the package.

Local USDA agencies, through TAP and its "outreach" activities,

The old variety store becomes a modern, attractive place to shop and a mark of confidence in Ewen's future.



are taking an active role in helping Ewen build its community of tomorrow. Advice and financial help have also come from other agencies and groups.

The Soil Conservation Service has given guidance to the Ewen Businessmen's Association and other local organizations in resource development. It has provided help in resource planning and application. It has given on-the-site technical assistance on soils, water management, vegetation, biology, and land use.

The Cooperative Extension Service has helped initiate rural beautification, cleanup campaigns, development of market facilities, and information programs.

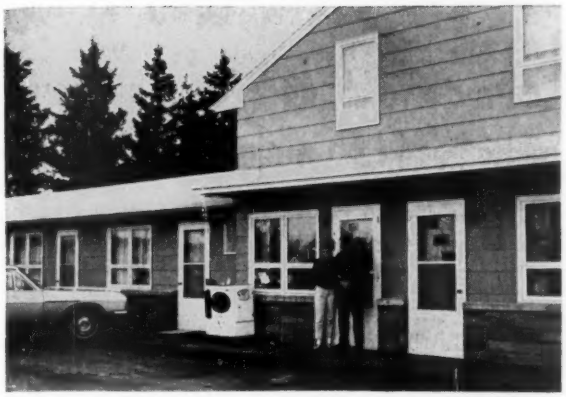
Farmers Home Administration has provided financing for rural home and farm improvements. Small Business Administration has provided financing for business improvements.

Agricultural Stabilization and Conservation Service has shared costs of projects that will help small farmers increase their incomes.

Ontonagon district directors have worked enthusiastically in the community, encouraging and assisting in planned developments that enhance rural life and increase rural income.

Ewen is already seeing results of its efforts. Jerald Strnad, a young man who grew up in the community, came back from the big city to build and operate a motel. He is one of 12 young men to return to Ewen recently. Other former residents, like Gene Potter, came back to Ewen's friendly and peaceful environment to retire.

William Malnar and William Johnson are building an 8,700-square foot variety store. James Flemming is putting the finishing touches on a new home. His is one of over a dozen new homes in the Ewen area.



Jerald and Ann Strnad came back to the "new" Ewen and operate this new motel.

Two adjoining school districts have been annexed to the Ewen district. The neighboring towns of Bruce Crossing and Bergland are also building, remodeling, and upgrading their service facilities.

"We expect Ewen to become a community where we can get medical and dental care, where our old folks can have a decent home for their retirement years, and where we can all enjoy the beauty and recreation potential of the north country," says Joe Strnad.

The enthusiasm and initiative generated in Ewen can be felt throughout the entire area. Everybody is optimistic about the future. They aren't waiting for the year 2000 to have their Community of Tomorrow. They are working on it today. ♦

Main Street will take on a new look, too, as Ewen moves toward tomorrow. New pavement and curbing are already in place.

Contractor adds ditch-lining business and multiplies RC&D project benefits

A New Mexico contractor has turned a conservation need into new jobs for seven people and dollars for the whole community.

I. M. Roybal of Pojoaque, N. Mex., 3 years ago expanded his house-building business to include concrete ditch lining for irrigation and invested $30,000 in extra equipment.

A factor in his decision was creation of the Northern Rio Grande Resource Conservation and Development Project. Local community leaders organized the project to focus technical and financial help from federal, state, and other sources on resource needs to turn the area's economic spiral upward.

Some of the assistance was channeled into improving irrigation systems.

The multiplier effect

Mr. Roybal expanded his contracting business and hired seven more men full-time to meet demands for new irrigation ditches. Seven families benefit from the employment, and Roybal buys more concrete in the community, more fuel, and parts for his equipment. Thus, dollars produce dollars to multiply the economic uplift.

Roybal has added his own innovations to a hand-placed ditch-lining operation. He mixes his own concrete in the field in a 1/6-cubic yard mixer mounted on the back of a small tractor. The concrete is dumped from the mixer into the ditch and shaped with a hand-pulled screed. The screed is guided by wooden rails placed on each side of the ditch. With this method Roybal can line about 350 feet of ditch a day.

The value of saving water

Roybal plans to further increase his operation later on with purchase of a slip-form ditch liner and increase his crew from seven to 11 men.

His customers often express their satisfaction with the efficiency of their new irrigation systems, for people in the traditionally water-short Pojoaque Valley know from experience the value of saving water.—BRUCE KIDMAN, *engineer, SCS, Santa Fe, N. Mex.* ♦

I. M. Roybal's tractor-mounted concrete mixer speeds service to his irrigation-ditch customers.

A hand-pulled slip-form (above) shapes the fresh concrete mix into a lining that eliminates seepage, saving irrigation water. Roybal (below) inspects the completed ditch.

Agencies join to save Puerto Rican parrot

The USDA's Forest Service and the Fish and Wildlife Service of the Department of the Interior have joined together to save the emerald green Puerto Rican parrot from extinction.

Less than 200 of the parrots remain alive and are found only in the 28,000-acre Caribbean National Forest in Puerto Rico.

The agencies will conduct an ecologic management investigation to determine the endangered bird's needs to recover its numbers.

They'll seek information on its reproductive processes, nesting habits, food requirements, natural enemies, and migration habits ♦

Resource conservation and development is the *name*. But the *aim* of RC&D projects is more. Their value lies not only in conservation action but also in ability to generate new and lasting jobs and income in an area. How to measure that ability? SCS and ERS are studying four of the first 10 RC&D projects and their impact on each area; some of the findings are shown in the table.

Adding up the benefits of RC&D

By Dwight M. Gadsby

Agricultural economist, Economic Research Service, Washington, D. C.

Specialists of the Soil Conservation Service and Economic Research Service are estimating the economic progress of selected Resource Conservation and Development projects in terms of increased gross income and new man-years of employment. This article describes how these economic evaluations are being made.

The goal is a complete inventory of all activated measures in an RC&D project involving both private and public expenditures. The evaluations rely heavily on economic data that are available for each measure. Estimates of private and public expenditures associated with project measures are made only when the actual figures are not available.

Evaluations are restricted to those benefits that can be estimated in dollars, although it is readily understood that there are other benefits. Community improvements such as clean water, freedom from congestion, and unpolluted air are important; but as yet no way has been found to quantify them, and they must be classed as "intangible" benefits.

A question repeatedly arises regarding expenditures and activities that would or would not have taken place without the RC&D project. The test used is the question: What and how much economic activity is now being done that was not being done before the project was established?

The first step in an evaluation is to inventory and classify each project activity into one of six categories: accelerated services (soil surveys, for example), structural measures (Public Law 566 watershed projects), critical areas (gullies or seriously eroding land), land treatment (terracing), associated measures (a maple products study), and supporting measures (a private lake development). For convenience, each project measure is identified by a number, usually the measure's number contained in the RC&D project plan. The possible length of life of each measure is estimated. This is important in order to determine how measures having different lifespans affect the economic life of the community.

Knowing the cost and duration of each project measure is extremely important, especially for those measures requiring an annual expenditure until completion. Estimated expenditures are grouped and totaled by short, intermediate, and longtime intervals. Community planners can then decide whether they are placing too many of their investments or expenditures in the present instead of the future, or vice versa. They can determine where bottlenecks and shortages will occur in their community development plans.

Determining the sources of funds used to finance RC&D project measures is not an easy task because the sources may be federal (RC&D or other), state, or local. Planners are interested in the ratio of public to private funds needed to encourage economic development. An important finding is that RC&D funds generally comprise a relatively small percentage of the total funds expended or invested.

It is important in this phase of evaluation that all possible expenditures and loans associated with the RC&D projects be identified and either estimated or actually measured. It also is important to differentiate between expenditures and loans that would have taken place without the project and new outlays that are stimulated by the project.

Estimated economic impacts of expenditures in the West-Central, Minn., Penn-Soil, Pa., Gwinnett County, Ga., and Upper Willamette, Oreg. RC&D projects

Project	Estimated expenditures	Estimated gross income	Man-years of employment				
			Construction	Technical	Annual	Other	Total
	Millions	Millions					
West Central	$ 4.0	$ 8.5	147	40	42	—	229
Upper Willamette	5 0	12.6	168	185	2	—	356
Penn-Soil	19.0	45.0	912	166	323	179	1,580
Gwinnett County	25.7	54.0	1,142	58	1,294	953	3,447

The next phase of the analysis is determining what proportions of the expenditures for each project measure are allocated to labor, machinery, materials, and other costs. Technicians and engineers who have firsthand experience in determining these types of costs are relied on to help with the estimates.

Another part of this analysis is estimating the "leakage" from the area—that part of the economic impact, either income or employment, that will accrue beyond the project area being studied.

For example, if a contractor building a Public Law 566 watershed structure comes from outside the area, it is reasonable to assume a significant amount of the income and employment effects of the measure's cost would be felt beyond the project area. Most of the workers hired to construct the measure would likely come from outside the project area. They could be expected to rent housing and purchase such things as food and gasoline within the area. But repair items, equipment, building materials, maintenance, and even fuel probably would be purchased outside the area.

These estimates should be made separately for each project area, although the relative proportions seem to show consistency between project areas. The techniques used lack precision, but they yield information that could not be derived in any other known fashion.

Employment, expressed in man-years, is one of the most significant portions of project evaluation. The new employment is directly related to new expenditures and classed into four types—technical, construction, annual maintenance and operation, and "all other."

Technical employment deals with the planning or layout necessary for setting up project measures. An example might be a surveying party laying out an earthmoving operation.

Construction employment is the physical work needed to create the project. An example would be a bulldozer operator grading fill material for a watershed damsite.

Annual maintenance and operation employment is: (1) Labor involved in actual maintenance of a project measure, or (2) employment that evolves from the creation of a type of new employment. The latter employment involves a primary function rather than maintenance function. An example might be construction of a furniture factory in a forested area. The new employment would recur annually, just like maintenance; but it would create much more employment of a longer duration.

Annual maintenance and operations employment gives a sound measure of the durability of the employment created and raises the community's economic base to a higher level than existed before its creation.

Income effects are closely related to the expenditure patterns described earlier. Estimates of gross income are derived by applying selected multipliers associated with similar areas. While this procedure produces useful estimates of gross income, care must be taken to avoid hazards. Application of these multipliers is conditioned by many factors, and the results must be interpreted with these limitations in mind.

Economic improvement is fairly sizable for the project areas evaluated. The more urbanized and industrialized a project area is, the greater the gains should be in income and employment per dollar invested. It costs less to add to an already existing environment than to construct a new one; therefore it should cost less to create a new man-year of employment in a suburban area than in a completely rural area. But the net contribution of the new man-year to the general well-being might be higher in a rural than in a suburban area.

The field evaluations reveal several unresolved issues:

- How to quantify some of the economic benefits in a project area.
- How to more precisely measure RC&D effects.
- How to find more reliable local multipliers.
- How to identify economic responsiveness to different types of investments.

These issues raise questions about the effects of commuting patterns, capital flows, and underemployment. More precise answers need to be derived as to amounts of local capital in the form of savings that will be invested in new development as a result of federal and state spending. Also needed is a more precise way to distinguish between one-shot employment effects and permanent effects.

Answers to these questions can increase the accuracy of RC&D project area evaluations. ◆

Bird banding helps in teaching conservation

The Litchfield County Soil and Water Conservation District works closely with the White Memorial Foundation on many projects on its 4,000-acre wildlife sanctuary and nature center in the towns of Litchfield and Morris, Conn.

George Sweeney, SCS work unit conservationist, found one of its more unusual conservation activities to be maintaining a bird banding station conducted by the foundation's ornithologist, Gordon Loery.

Mr. Loery pointed out that it is a small station where about 1,500 birds were banded last year. Band-

Gordin Loery applies a numbered band to the bird's leg.

ing is a tool, not an end in itself, he said. Its importance is the recorded returns of birds that are retrieved by the bander or are recovered by another person who then reports the banded information to the U. S. Bureau of Sport Fisheries and Wildlife.

Locally, however, it has been of value as an arm of the educational activities of the foundation and its nature center in teaching several hundred students a year.

Habitat improvement practices suggested in the 4,000-acre soil and water conservation plan are designed to maintain bird traffic at high peak.—ALICE ROGERS, *Litchfield County Soil and Water Conservation District, Litchfield, Conn.* ♦

Land treatment basic to small watershed project

Land-treatment measures are basic to any watershed project. Structural measures cannot be fully effective unless these soil and water conservation measures are applied on individual farms and ranches, other rural land, and the public land of the watershed. ♦

Drop spillways stop 30-year gullies

Three concrete drop spillways solved a 30-year problem for Davis Green, dairyman of Albany, Ohio, and a cooperator with the Athens Soil and Water Conservation District.

Green's problem was gullies at three spots where 40-year-old tile lines led into culverts along a county road. After trying many remedies such as filling and sodding, rock walls, steel pipe extensions to the tile ends, and post-supported walls made of locust plants, Green consulted SCS Area Engineer Paul Hossler, who recommended the concrete drop spillways.

The spillways resemble three-sided boxes open at the front. The protected tile lines outlet into steel pipes which enter the box at the back.

This kind of concrete structure is good for trouble spots like Green's where tile and waterways must outlet at the same place. It is also effective in situations where sod chutes aren't satisfactory. For instance, the structure may be used in places where grassed waterways outlet into streams or road ditches, at diversion or terrace outlets, or at places around buildings where it is desirable to step surface water down from one level to another.

Green and his wife, helped by their four boys and little girl, operate a 40-cow dairy farm. The land is fairly level and lends itself well to the modern equipment used. Conservation management of soil is visible over most of the 240 acres.

"I had tried for more than 30 years to stop these gullies. I once knocked the front end off a tricycle tractor by hitting a tile hole," Green said. Now he has found the answer.—RODNEY V. HAYDEN, *soil conservationist, SCS, West Union, Ohio.* ♦

Davis Green and son, with John Miller, SCS work unit conservationist, identify concrete structure at tile outlet that has eliminated the gullies so long plaguing the farm.

Bringing up crawfish

Field trials and research turn farm hitchhiker into commercial crop

By Olan W. Dillon, Jr.

Regional biologist, SCS, Fort Worth, Tex.

The crawfish gourmet concerned about the dwindling harvest of his favorite dish from rivers and swamps can take heart at field trials and research that are turning Louisiana crop fields into high-producing crawfish farms.

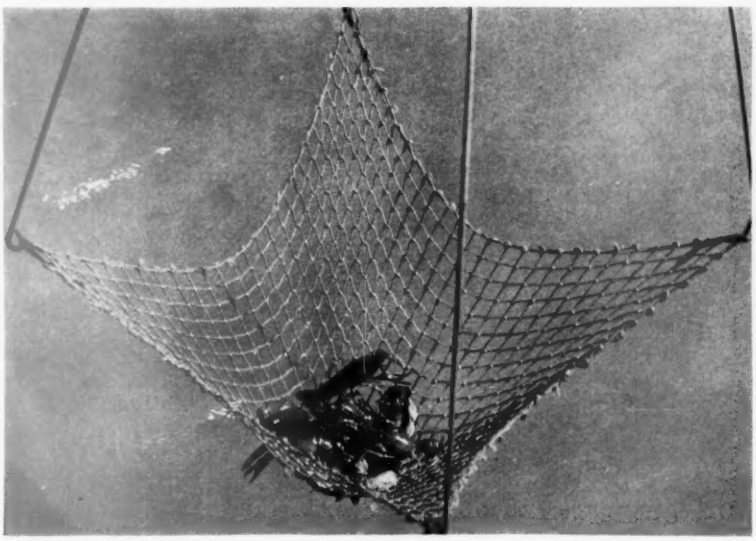
Levees built along major streams and canals that cut into lowlands and swamps have reduced the natural habitats of the commercially important swamp and White River crawfish.

Both species grow rapidly, however, in farm fields where crops such as rice are irrigated and fertilized. The waterflow makes them feel at home. But production has varied greatly from year to year in both field and stream.

In the middle 1950's, farmers who flooded fallow ricefields in the winter to control weeds and smooth the land often found a crop of crawfish in the spring. Not knowing why some fields produced crawfish and others did not, the landowners either gave the crawfish away or charged a small entrance fee to catch them.

Field trials

In 1960, SCS Biologist Carl Thomas tackled the production problem with a series of field trials near Crowley, La. Within a few years farmers were applying the farm production methods developed from these trials. Ten thousand acres were in crawfish fields in 1967, producing 6 million pounds of crawfish. Farmers have



Charlie Martin (above) checks the crawfish traps in this flooded field twice daily and harvests 40 to 70 pounds of crawfish a day. The crawfish (left) weigh about six to the pound.

A sign near Crowley, La. (above) directs customers to Bert Gilbert's plant where he processes his own and his neighbor's crawfish. Roland Faulk's daughter (left) shows the size of crawfish raised on their farm.

Pump at work flooding a 700-acre crawfish pond. The ½-inch wire netting keeps out small game fish.

put in additional 3,500 acres for the 1968 crop year.

The increased supply of crawfish, also called crayfish in some parts of the country, opened up new markets. Most public eating places in southern Louisiana started serving crawfish dishes during the spring crawfish season. Frozen food companies began to look at possibilities of marketing crawfish products all year. Previously, only a few specialty restaurants had prepared such gourmet crawfish dishes as etouffe, bisque, stew, potpie, and salads.

All was not well, however. With larger acreages of land in crawfish, problems developed. The field trials started by Thomas were not research, but they showed the way to dependable production and helped to define problems that needed further study.

Parallel problems

Parallel with production difficulties, problems developed in the processing industry. Because crawfish dishes had been mainly a home or specialty-restaurant product, mass-production methods were

Cleaned crawfish chill in a cooler at John Rupert's processing plant near Eunice, La.

Local workers at Rupert's plant process 1,200 pounds of crawfish a day or more. With a mechanical peeler they could greatly increase that figure.

lacking. Questions of proper storage temperatures (especially for fat which is important in the preparation of etouffe), possible byproducts, and many others remained unanswered.

Then the Louisiana Association of Soil and Water Conservation District Supervisors called a meeting of all research agencies in Louisiana to discuss research needs in this budding industry.

Coordinated research

As a result, Louisiana State University, the University of Southwestern Louisiana, and the Louisiana Wildlife and Fisheries Commission agreed to undertake the necessary research.

The Department of Food Science and Technology in LSU's school of agriculture is studying processing problems. The University of Southwestern Louisiana is doing research on biology of the crawfish. The Wildlife and Fisheries Commission is handling other parts of the research. The following studies are underway:

(1) Analysis of crawfish catches.

(2) Improvement of the storage quality of fresh peeled crawfish tails.

(3) Development of marketable crawfish products.

(4) Determination of microorganisms in crawfish that may affect public health.

(5) Bacteriological examination of processed crawfish products from commercial plants and retail markets.

(6) Quality of crawfish from various sources.

(7) Analyses of present handling and processing procedures.

(8) Analyses of prices of crawfish and crawfish products.

(9) Recommendations for handling fresh crawfish and tail meats.

(10) Utilization studies of waste products, especially crawfish waste meal.

(11) Development of a mechanical crawfish peeler.

(12) Study of the practicability of packaging boiled, seasoned, whole crawfish.

With the widespread cooperation on these and other problems the producer, the processor, and the consumer can look forward to increased profits and pleasure from this new commercial agricultural crop. ◆

Terracing to shorten slopes

Slope lengths too long for erosion control by contouring alone can be shortened by terracing. ◆

Pump drainage picks up where tile leaves off

One farmer who refused to be limited by the lack of an outlet for a tile drainage system is Paul Niebel, a cooperator with the Henry Soil and Water Conservation District in Ohio. He installed pump drainage to overcome his high water-table problem.

The need for deeper tile outlets, increased availability of electricity, and power from gasoline engines have all made pump drainage attractive to many landowners in recent years.

Mr. Niebel's farm has less than 1 inch of fall per 100 feet over most of the area. The soil is Mermill fine sandy loam, a dark colored and very poorly drained type. It is highly productive, but tile drainage is required to control the high water table and remove other excess water.

The Soil Conservation Service designed the pump and the needed water-storage area as part of the conservation plan on the Niebel farm.—RUSSELL C. MILLS, *work unit conservationist, SCS, Napoleon, Ohio.* ◆

New conservation district next to New York City

Historic Yonkers and White Plains, N. Y., next door to New York City, now are in a soil and water conservation district.

The newly formed Westchester County Soil and Water Conservation District is an area that has undergone rapid urban growth in the last few decades. This urbanization has taken its toll in accelerated erosion, pollution, and resource waste.

The district's board of directors has developed a long-range program designed to preserve and restore the quality of the environment in the county. ◆

Keeping the shirts on our back . . .

RC&D help rescues a Tennessee town from loss of industry by floods

By Nathan I. Brown and Artice K. Booher

Assistant state conservationist, SCS, Nashville, and RC&D project coordinator, SCS, Cookeville, Tenn.

A 54-inch conduit running beneath the streets of Livingston, Tenn., has helped the town's residents sleep a lot easier on rainy nights.

Residents remember all too well the water-filled nightmare in 1962 before the flood-prevention measure was installed as part of the Hull-York Lakeland Resource Conservation and Development Project.

It was late in February. For 3 days the rains fell in torrents on the hills and valleys of the Upper Cumberland around the county-seat town.

At 3 a.m. on February 27 a call for help went out from the local shirt factory, employer of 1,400 people and the area's economic mainstay. Tons of floodwater was pouring into the factory and covering machinery, raw materials, and finished goods.

Volunteers rushed in and worked feverishly for 30 hours, moving equipment, supplies, and finished goods to upper floors and to other buildings as floodwaters continued to rise.

Radio Station WLIV, also in the path of the flood, could be reached only by boat. It rendered invaluable service to the community until forced off the air on February 28.

Many personal emergencies developed. Less Vann had to carry his wife from their flooded home. A teacher caught away from home had to borrow a boat to rescue his clothes before school. The postmaster's garage was flooded.

When the flood finally subsided, the community had suffered damage exceeding $400,000, including $68,000 in lost wages. The economic life of the entire area was threatened. There was talk that the factory would be closed unless the flood problem could be solved.

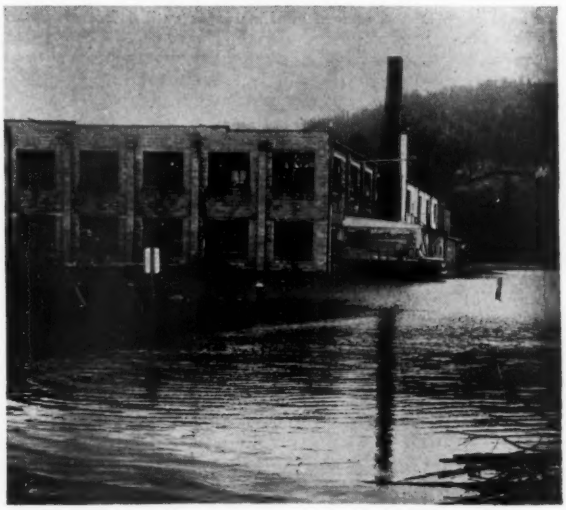
Search for a solution

Overton County is typical Appalachian foothill country. Nestled close to the western edge of the Cumberland mountains, the area is rich in pioneer tradition, good neighborliness, and natural beauty but with limited opportunities. Except for a few winding hard surfaced roads, the area is isolated. Out-migration has drained the area of much of its youth and talents.

Over the years many plans had been advanced and several attempts made to solve the flood problem to preserve what opportunities remained. Nothing worked. The job was too big, too complex, and too expensive for a small town's resources. Back in the mid-thirties, local leaders tried to get something done under the Works Projects Administration, but to no avail.

The flood area, boxed in by surrounding hills, is a victim of freak geography. Normal runoff water from 3,000 acres of farmland enters a sinkhole above town and passes safely and unseen beneath the city by way of underground caverns.

Workmen (left) install a liner for the conduit that will carry floodwaters 28 feet beneath a state highway. Without the conduit, the Livingston Shirt Factory (right) would be forced to leave town, taking 1,400 jobs with it.



Water stood in some of these homes more than a week after the 1962 flood.

But heavy runoff meets a restriction somewhere in the caverns, and floodwater backflows into an area occupied by the shirt factory, several small businesses, and a residential area. Frequent flooding had created an unsanitary 5-acre swamp within two blocks of the courthouse.

John Saddler, mayor at the time of the 1962 flood, said: "My telephone rang constantly. I was blamed for everything—the rain, the flooded factory, flooded streets, and even for the snow that fell on Wednesday night." Mayor Saddler called in pumping equipment from McMinnville and Lebanon, 65 and 75 miles away. This effort cost $20,000 and had little effect. Another failing effort was to blast away the restriction in the caverns, it was too deep underground to be found.

There have been several smaller floods since 1962 with the ever-present specter of another disaster that might permanently close the factory.

Success at last

When the Hull-York Lakeland RC&D Project was authorized in late 1966, the people of Livingston saw a new glimmer of hope, perhaps the last hope for solving a flood problem that had plagued them for a generation. They submitted their problem to the RC&D directors as a proposed project measure.

SCS engineers made a study. An open ditch was ruled out because of its enormous size and depth and required location—right through the residential area. An alternative solution was to run about 1,100 feet of underground conduit some 28 feet beneath a city street and several vacant lots to an outlet into a nearby stream.

The project measure was approved and RC&D funds were used. The job was contracted for about $118,000. The city furnished easements and rights-of-way and installed bridges and culverts, for about $31,000. Work was begun in June 1967 and completed that fall.

Now, the swamp is rapidly drying out and no longer will mar the appearance and health of the adjoining residential area. The factory will stay and can expand as needed. Other commercial and industrial developments in the town can take place without fear of flooding. One new business has already been established in the low area. Others are planned.

Economists have calculated that the project will yield $4 in benefits to each $1 of cost. But in terms of job security, peace of mind, and freedom from a chronic sanitation problem, the people of Livingston believe the benefits incalculable. ♦

The local radio station relayed vital messages until 4 feet of water forced it off the air.

Room to grow

Rural America has adequate space for more people to live, work, and play; to perpetuate America's heritage; and to assure a strong community and family life with gainful employment and wholesome leisure. The enduring strength of our society may well depend on the future development and use of America's countryside. ♦

Ducks favor grassy shores

Ponds and marshes with bare shorelines are not high duck producers. Ducks shun a bare shore in favor of a grassed one except for daytime loafing. Trampling by cattle is the usual cause of bare, muddy shores although a drop in water level may have the same result. ♦

A truck farmer against the floods

Hezekiah Catchings (left) and SCS Conservationist Cecil Reeves examine farm plan.

What flood protection means to the truck farmer is contained in the knowledge that one flood can wipe him out.

A crop delayed 2 weeks may never pan out.

A field can be destroyed by overflow. If it is late in the season, the flood may mean total loss. If time permits replanting, there are double costs of labor, seed, and fertilizer.

A man who farms 80 acres can less afford to lose than the man who cultivates a thousand acres.

Such a man is Hezekiah Catchings, Crystal Springs, Miss., who farms in the Copiah Creek watershed. Each year he has had to replant a truck field capable of producing tomatoes that melt in your mouth and peppers that command top prices.

"One cabbage crop got ruined by sand that the high water carried in," said Mr. Catchings. "I lost about $1,000 that year. Most years it's not that bad. I replant and make a crop, but it costs me more."

Catchings, a cooperator with the Copiah County Soil Conservation District for 20 years, has battled the inroads of flood and fire without losing heart. Several years ago, when his house burned down, he rebuilt a nice home.

When he heard that the local soil conservation and drainage districts were sponsoring a watershed project to solve flooding problems, he organized 23 of his neighbors to petition in support of the project.

All the creeks in Copiah County draining into the Pearl River are included in this Public Law 566 project that extends over most of the eastern part of the county. The area contains some of the most fertile land in the state, on several hundred farms.

The Copiah Creek project is now being planned with SCS help.

Plans include establishment of grass cover, terraces, diversion ditches, and other measures to protect upland areas and prevent sediment rolling off into the streams and valleys. It was sediment damage several years ago that cost Catchings his cabbage crop.

Also included will be floodwater-retarding dams. Many farmers will take advantage of water supplies stored behind these dams to irrigate their crops and eliminate the hazards of truck-farming without sure water.

Hezekiah Catchings is one of these. "I'm thinking about irrigating my tomatoes and peppers from one of these reservoirs," he says.

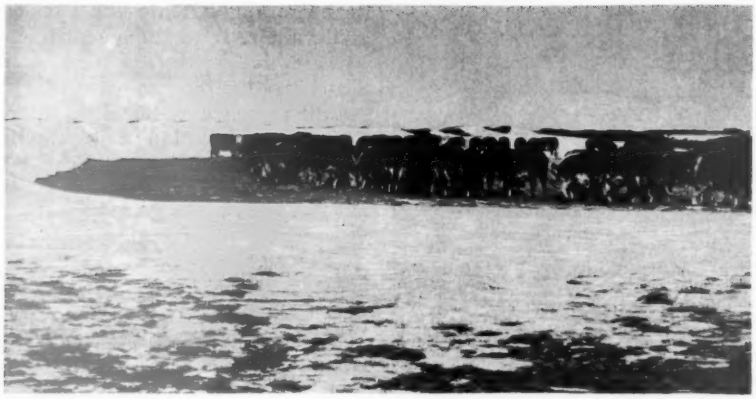
Through the years he has renovated his upland pastures and established rotations, contour farming, cover cropping, and row arrangements to his valley land.

Catchings is a director of the Copiah County Forestry Field Day for Negro landowners, a deacon and officer in the Brushy Creek Baptist Church, and a secretary of the Baptist Men's Association, which includes members from eight churches. ♦

Many commercial farms earned higher incomes in 1967

Net farm incomes in 1967 were higher than in 1966 on 22 of 32 important types of commercial farms located in 20 major farming areas of the United States.

Those earning higher incomes included: Dairy farms in several parts of Wisconsin; broiler farms in Maine, the Delmarva peninsula, and Georgia; cotton farms in the Mississippi Delta, High Plains of Texas, and San Joaquin Valley, California; tobacco farms in the North Carolina Coastal Plain, Kentucky Bluegrass, and the Kentucky-Tennessee Pennyroyal area; spring wheat-corn-livestock farms in the Northern Plains; winter wheat-grain sorghum farms in the Southern Plains and winter-wheat-pea and winter wheat-fallow farms in the Pacific Northwest; cattle ranches in the Northern Plains and the Northern Rocky Mountains; sheep ranches in Utah and Nevada. ♦



Cattle seek the protected area, void of snow, behind an earthen windbreak.

Earthen windbreaks

give cattle a break on the open plains

By Donald J. Heyne

Work unit conservationist, SCS, Cheyenne, Wyo.

Manmade mounds of earth are being built on Wyoming's Laramie Plains as low-cost wind dampers that protect cattle during bad weather and help distribute livestock on the range.

About 200 of these embankments dot the plains around Laramie. Twelve of them serve as livestock windbreaks for the Radical Ranch, 28 miles north of Laramie.

Do they work?

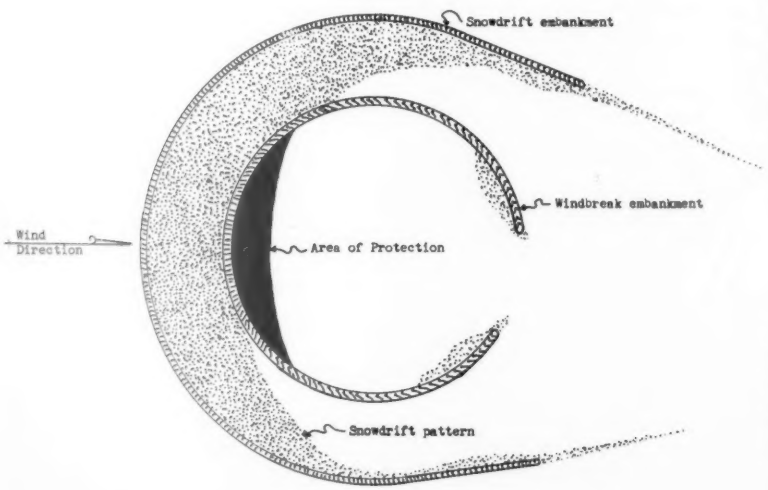
"You bet they do," says Pat Ryan, manager of the ranch and a cooperator with the Laramie Rivers Soil and Water Conservation District. "The cattle use those shelters every night for a bedding ground during the fall and winter months."

On the semiarid Laramie Plains natural barriers are few and poorly spaced, tree windbreaks are hard to establish, and slab or similar windbreaks are expensive. This prompted ranchers to build embankments of various shapes and forms, and, since the early 1950's, a general design has evolved.

The most popular design includes two earth embankments in a semicircle, three-quarters circle, or U-shaped arrangement. A large embankment 6 to 8 feet high provides protection for the livestock. A smaller embankment, about 3 feet high and 75 to 100 feet from the windward side of the larger embankment, is built to catch most of the drifting snow.

Low-cost construction

The earth windbreak is located on soils least susceptible to wind and water erosion and on topography which allows drainage of the area to be protected. The embankments are constructed with a bulldozer. The larger or windbreak embankment is constructed first. Earth is borrowed from the windward side, and the slope is made as steep as the soil permits. The earth for the smaller or snowdrift embankment is borrowed from the same area as the large embankment. This leaves a catchment basin for snow and rainfall. Aver-



This design for an earthen windbreak shows a large windbreak in the center, a smaller snowdrift embankment, and the borrow area and catchment basin between them. The wind velocity in the protected area may be reduced 50 percent as far as 20 to 30 feet inside the windbreak. A windbreak 400 feet long is large enough to provide protection.

age length of the earth embankments is about 500 feet.

The embankments built by contractors have been constructed on an hourly basis, and the cost of individual windbreaks has varied from $70 to $120. Costs of constructing a wood-slab windbreak on the Laramie Plains have averaged from $700 plus yearly maintenance. The maintenance required on earth embankments is nil.

Finishing touches

Soil movement on the earth embankments has not been notably greater than in the undisturbed areas. In order to retard wind erosion, Ryan has seeded several of his earth embankments and borrow areas with western wheatgrass and reports a good stand. It is also possible to plant tree windbreaks in the borrow area if the soil is deep enough and the area protected from livestock.

Ralph Stahley, SCS work unit conservationist serving the Laramie Rivers District, says, "You ought to see cattle enjoying those earth windbreaks during blizzard conditions, while cattle without protection are all huddled up in the fence corners."

Pat Ryan says that by planning the location of earth windbreaks, ranchers can get better distribution of livestock on the range resulting in more efficient use of forage and more dollars in the pocket at selling time. ♦

Electricity at last

More than 2,500 people in Missouri, Montana, Oklahoma, and Texas will have electricity in their homes for the first time as the result of loans approved by the USDA Rural Electrification Administration.

Loan funds totaling $4,416,000 will enable four REA borrowers to finance 295 miles of distribution line, 21 miles of transmission line, and eight new substations and to improve existing facilities. ♦

He sees the land and understands

Ross Strickland stands by a loblolly pine in a mixed stand where he is deadening the hardwoods.

If you haven't been enthusiastic about conservation and the benefits of a good forestry program, you should spend a day with Ross Strickland on his tree farm near Romance in White County, Ark.

Ross is retired from military service. He spends most of his time as a sales representative on Okinawa, 7,000 miles from White County. But if you visit with him awhile you know he spends a lot of time thinking about the half-million-plus trees that he has planted on 700 acres of badly eroded cropland that formerly was used primarily for the production of cotton.

It is said that a conservationist is one who sees the land and understands what he sees. Ross began to see and to understand the need for land use changes in 1937 when he was planting trees for the Civilian Conservation Corps.

Ross pointed to a grove of pine and said, "This is the first 40 (acres) that I bought. That was in 1937. I paid $300 for it by taking $10 a month out of my $45 CCC camp check." Down the road he pointed out the old Strickland farmstead where he grew up. It is now surrounded by a young stand of planted pine.

Ross set a fast pace as we toured the 700-acre tract. We crossed numerous old cropland fields all planted in pine varying from 2 to 13 years old. Every field is protected by a well-kept firelane. Occasionally, Ross called our attention to the scars of old gullies now healing under a mulch of pine needles.

Most of the open field tree planting is finished. Ross is now starting his timberstand improvement program on the hillsides that are covered mainly with cull hardwoods. The procedure he uses is to inject 2-4-D at the base of the cull trees.

No phase of conservation is overlooked on the Strickland tree farm. Ted Hall, forester with the State Forestry Service, is a frequent visitor. Ross also works closely with the White County Soil and Water Conservation District, Soil Conservation Service, and the Agricultural Stabilization and Conservation Service people.—THOMAS BURKETT, *work unit conservationist, SCS, Searcy, Ark.* ♦

What soil is

Soil is a storehouse of plant nutrients, a habitat for bacteria, an anchorage for plants, and a reservoir that holds the water needed for plant growth. ♦

Shooting preserve takes the pain out of duck hunting

Most of today's duck hunters face the problem of where to find quality shooting. Pete Lunsford of Eufaula, Ala., is providing sportsmen with one answer—a duck shooting preserve.

Pete owns and operates Pete's Mallard Ranch. He raises mallard ducks in captivity and offers them to hunters under conditions that test their shooting skill as sharply as the open marshes. The birds are trained to fly from a tower to a pond over the hunters concealed below.

The training starts when the ducks are 8 to 10 weeks old. Pete teaches them to walk downhill from the holding pen to the home pond, a distance of about 450 yards. At first the ducks are driven each day down an enclosed walkway to the pond.

Starting 2 weeks before shooting season, Pete makes his ducks fly that distance every day. He uses as a "flight tower," adjoining the holding pen, an inclined walk about 50 feet long rising to a height of 20 feet.

A few of Pete's ducks don't like to fly. Some merely jump from the tower to the ground; others fly only a short distance and alight. Since lazy flyers are not suited for hunting, but their table qualities are excellent, they promptly land in the freezer.

Elusive targets

The downhill area between the holding pen and the pond is wooded, creating a natural surrounding for shooting. As the ducks take off from the tower and fly zigzag over the trees to the pond, they provide quality shooting. According to Pete, the average shooting preserve hunter fires seven or eight shots for each duck he kills.

Duck hunting on a shooting preserve is especially attractive to the sportsman who doesn't like to crawl out of bed in the wee hours of a cold morning; drive to a far away place; then wait long hours in an uncomfortable blind for ducks that may or may not show up. On a shooting preserve, the hunter knows that ducks will be there.

Plans for hunting

Pete's shooting preserve didn't just happen. He gave it a great deal of thought and planning. He started with a conservation plan drawn up with help from the Soil Conservation Service. The pond was Pete's first consideration. Then, he designed his blinds to prevent lead shot from falling into the pond and causing lead poisoning of the ducks.

Pete also plans to provide hunting in the future for bobwhite quail, European wild hog, wild turkey, and whitetail deer. For deer and turkey, he is planting wheat, clovers, and ryegrass for green winter grazing. For bobwhite, he is planting such crops as bicolor and annual lespedeza in small, well-scattered plots throughout his shooting preserve.

Pete does not expect shooting preserves to take the place of other hunting. As far as he is concerned, natural hunting has no rivals. But he does believe that shooting preserves can and do provide quality shooting for sportsmen who have few opportunities for natural hunting.—SAMUEL H. GEIGER AND ROBERT E. WATERS, *soil conservationist and biologist, SCS, Gadsden and Auburn, Ala.* ◆

Wildlife in prairies

Prairie farmlands today support more kinds and greater numbers of birds, mammals, and fish than when the white man first saw them.

Hunters in the prairie States today find doves, deer, and squirrels in numbers seldom seen by early explorers. ◆

Meetings . . .

Manufacturers continue interest in conservation

The National Association of Manufacturers annual Congress of American Industries will be held in New York City on December 4–6.

The association has been concerned with principles of resource management for more than 20 years. Its Natural Resources Committee studies natural resource requirements of industry and recommends conservation and utilization policies that will assure a continuous supply of those resources.

NAM is one of the original sponsors of the National Watershed Congress. Its interest in watershed protection, forestry, soil and water conservation, and mining practices is substantial. *Our Native Land,* a basic handbook on wise use and management of natural resources, now in its third edition, has been one of the most popular educational booklets on conservation ever published.

Science researches food crisis and new frontiers

The Section on Agriculture will discuss "Research for the World Food Crisis" and "New Frontiers of Agricultural Research" during the annual meeting of the American Association for the Advancement of Science in Dallas, Tex., December 26–31.

A Committee on Science in the Promotion of Human Welfare and Scientists' Institute for Public Information will conduct a symposium on "Unanticipated Environmental Hazards Resulting from Technological Institutions." A Committee on Arid Lands is arranging a symposium on "Water Importation into Arid Lands." Twenty additional sections of the AAAS will hold meetings simultaneously.

Three major addresses on Fron-

tiers of Science as well as a panel discussion on Science Technology and Latin American Development will be presented during the general sessions.

Seed conference spotlights profits in forage crops

The Annual Farm Seed Conference scheduled for December 4, Dallas, Tex., will highlight the profitable uses farmers can make of soil conserving forage crops. The 1-day conference is sponsored by the American Seed Trade Association and immediately follows the annual meeting of the Southern Seedsmen's Association.

Some of the topics are "Concrete or Crop Land," "New and Profitable Forage Grasses," and "Profit Opportunities From Pasture and Range."

Dates and Places

December 1–7, American Association of State Highway Officials, Minneapolis, Minn.

1–14, American Farm Bureau Federation, Kansas City, Kans.

2–4, American Seed Trade Association, Farm Seed Conference, Dallas, Tex.

2–4, Newspaper Farm Editors of America, Denver, Colo.

2–4, Agricultural Relations Council, Chicago, Ill.

3–6, Western Forestry and Conservation Association, Seattle, Wash.

6–8, National Association of Manufacturers, New York, N. Y.

7–11, National League of Cities, New Orleans, La.

10–13, American Society of Agricultural Engineers, Chicago, Ill.

26–30, National Association of Biology Teachers, Dallas, Tex.

26–31, American Association for the Advancement of Science, Dallas, Tex.

January 1969

14–15, National Council of Farmer Cooperatives, Washington, D. C.

19–23, American National Cattlemen's Association, Honolulu, Hawaii

26–29, National Woolgrowers Association, San Francisco, Calif.

Outdoors—our heritage

A fundamental heritage of the American people has been the opportunity to know the outdoors—its character, its challenges, and its wonders. Traditionally, experience and activity in the open country have been an important part of the lives of most of our people.

Review

The Land Renewed. By William R. Van Dersal. *1968. Rev. ed. Henry Z. Walck, Inc., New York. 160 pp., illus. $6.00*

This enlarged and updated edition of a book first published in 1946 strikes squarely home to the need for a simple, forthright, balanced statement of the problems and opportunities in land resource use in modern America.

To the urban resident uneasy about such things as pollution, urban sprawl, and land deterioration, it will give a quick overview and historical perspective to the subject. It is a handsome, literate book that would be right at home on a highrise apartment coffee table.

It will be equally effective in the school room as a general introduction to the subject of natural resource conservation.

The new edition is thoroughly up-to-date with many new photographs among the 80 or more that face the reader from every right-hand page.

The book is dedicated to Edward H. Graham, "one of the world's great conservationists," who was coauthor of the original edition.—B.O.

Design of the Housing Site. By Robert D. Katz. *(1966) 1967. Small Homes Council—Building Research Council, Univ. of Ill., Urbana. 233 pp., illus. 2d. printing. Single copy free.*

Subtitled "A Critique of American Practice," this handsome and profusely illustrated album is the report of a study funded jointly by the Department of Housing and Urban Development and the Mobile Homes Manufacturers Association.

The stated goal of the report is threefold: "To identify factors, both technical and procedural, essential to high-quality residential site planning; to document current practices throughout the United States; and, where appropriate, to recommend ways of improving site planning. The focus is on design and its relation to livability."

The result is a competent treatment organized under the principal headings of "Housing Types and Residential Density," "The Site," "The Plan—Private and Communal Aspects," "The Plan—Functional Aspects," "Innovations," and "Site Planning Regulations and Design Incentives."

The document will be useful to professional people and citizens concerned with land use planning and design in urban areas.—B.O.

New publications

Sanitary Landfill Facts. By Thomas J. Sorg and H. Lanier Hickman. *1968. U.S. Dept. Health, Education, and Welfare, Public Health Service. 26 pp., illus. $0.35.* The publication examines the planning, design, operation, and public health aspects of sanitary landfills and is offered as an aid to the growing number of people involved with planning and development in solid waste-disposal management.

Today and Tomorrow in Air Pollution. *1967. U.S. Dept. Health, Education, and Welfare, Public Health Service Publication 1555. 28 pp., illus. $0.35.* The report points out that carbon monoxide, sulfur oxides, hydrocarbons, photochemical smog, and particulate matter, the principal air pollutants, are caused by our modern civilization and that even with the greater efforts at local and regional levels and state governments, more dollars for research and development, many more trained people, and bigger budgets for control programs make it possible to just stay even.

Federal Outdoor Recreation Programs. *1968. U. S. Dept. of Interior, Bureau of Outdoor Recreation. 224 pp.* A descriptive index of outdoor recreation programs and services of Federal agencies, independent agencies, commissions, and councils. Part A summarizes the functions and services of nine cabinet-level departments and their 57 agencies, bureaus, services, administrations, and offices, and also of 36 independent agencies, advisory boards, commissions, and councils. Part B summarizes in detail 263 programs relating

directly or indirectly to outdoor recreation. Among these are programs involving resource management, grants, credit, technical assistance, regulations, coordination, information, training, and research.

New England Heritage, The Connecticut River National Recreation Area Study. *1968. U. S. Dept. Interior, Bur. of Outdoor Recreation.* $1.00. Beautifully illustrated, this study reveals that the Connecticut River Valley contains the resources, potentials, and needs which meet the criteria for a National Recreation Area. The study's action plan proposes the blending of a small amount of land acquisition with scenic easements, conservation zones, and cooperation at every level of government and private responsibility, to preserve and enhance the outstanding character of the river and to take maximum advantage of the recreation potential of the river for the future.

Science and Improving Our Environment. *1967. USDA Agr. Res. Serv.* [12] *pp., illus.* Shows how agricultural research helps prevent pollution in several ways: by protecting streambanks and using other means to prevent the silting of rivers, by disposing farm waste, by controlling pests with pesticides as well as using safeguards against over-use of pesticides, and by planning for the control of radioactive fallout should it occur in the future.

Crop Yield Response to Fertilizer in the United States. By D. B. Ibach and J. R. Adams. *1968. USDA Statistical Bull. 431. 295 pp. $1.75* Supplies one basis for current appraisals of the economic position of fertilizer use and to project economic potentials for fertilizer use and crop yields. The estimates show crop yield responses to fertilizer in defined areas.

Farm Costs and Returns, Commercial Farms by Type, Size, and Location. *Rev. 1968. USDA Agr. Inf. Bull. 230. 77 pp., illus. $0.55.* Contains summary estimates of costs and returns for 1967 and other recent years for 32 important types of commercial farms in 20 major farming areas in the United States. Gives a brief analysis of changes that have occurred in production, prices, income, and costs for each type of farm.

A Directory of Research Natural Areas on Federal Lands of the United States of America. Compiled by the Federal Committee on Research Natural Areas. 1968 *(Superintendent of Documents) Washington. 129 pp. $0.70.* In line with the U.S. participation in the International Biological Program, the Department of the Interior initiated the establishment of the Federal Committee on Research Natural Areas in February 1966. The committee includes representatives of the Forest Service, USDA, and Bureau of Land Management, Bureau of Sport Fisheries and Wildlife, and National Park Service, USDI.

These agencies administer most of the federal lands upon which natural science research potential exists. The directory is an inventory of 336 federally owned areas "where natural processes are allowed to predominate and which are preserved for the primary purpose of research and education."

Helping the Handicapped in Rural Areas. *1968. USDA Federal Exten. Serv. 11 pp., illus.* Outlines the public programs designed to assist the handicapped.

Construct Conservation Measures Safely, Prevent Accidents. *1968. USDA PA-878. 4 pp., illus.* Gives safety precautions in applying conservation measures.

Soil surveys

Pulaski and Alexander Counties, Illinois. By Walter D. Parks and J. B. Fehrenbacher. *1968. 121 pp., illus.; maps 4 inches to the mile (1:15,840).* Fieldwork by Walter D. Parks, C. C. Miles, J. M. Paden, and B. J. Weiss.

Howard County, Maryland. By Earle D. Matthews and Merl F. Hershberger. *1968. 104 pp.; illus.; maps 4 inches to the mile (1:15,840).* Surveyed by H. J. Bryant, Elvin Z. W. Compy, Merl F. Hershberger, Richard L. Long, David G. Long, Elmer F. Sauer, W. G. Souder, and Philip J. Walter.

Davis-Weber Area, Utah. By Austin J. Erickson and Lemoyne Wilson. *1968. 149 pp.; illus.; maps 4 inches to the mile (1:15,840).* Soils surveyed by Vern K. Hughie, Woodrow Nielson, and Raymond S. Chadwick.

Cleveland County, Arkansas. By Fred C. Larance, James E. Jay, William R. Elder, Jimmy L. Daniels, and George E. Barnum. *77 pp., illus.; maps 4 inches to the mile (1:15,840).*

Thayer County, Nebraska. By Robert S. Pollock. *1968. 52 pp., illus.; maps 3.17 inches to the mile (1:20,000).* Soils surveyed by Robert S. Pollock, Lyle L. Davis, and Vernon Seevers.

Pratt County, Kansas. By Marcellus L. Horsch, Bruce R. Hoffman, and Donald A. Gier. *1968. 55 pp., illus.; maps 3.17 inches to the mile (1:20,000).*

Cross County, Arkansas. By James L. Gray and Vernon R. Catlett. *1968. 61 pp., illus.; maps 3.17 inches to the mile (1:20,000).*

Deaf Smith County, Texas. By Luther C. Geiger, Herbert E. Bruns, and Billy R. Chance. *1968. 63 pp., illus.; maps 3.17 inches to the mile (1:20,000).*

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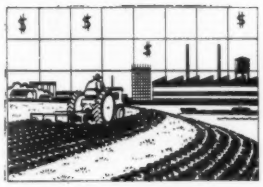
From the Administrator:

Conservation and Economic Development



From the beginning of the Soil Conservation Service, conservation and resource development have been tied to economic growth.

A proper mix of resources, people, and investments results in job creation; higher disposable income; higher quality food and water; better homes, schools, highways, and community facilities; and other elements essential to an improved environment.

As the technical agency responsible for advocating proper land and water use—and the conservation treatments associated with such uses—SCS provides valuable technical assistance to individuals and local sponsoring organizations in their conservation planning and actions.

In recent years, we have witnessed a rapid change in the economic life of our Nation. Increasing population, a higher income level, and more leisure time have increased demands and competition for space—not only for our basic needs of food, clothing, and shelter, but also for the physical expansion of housing, industry, community facilities, and the like.

Progress in science and technology has highlighted the need for a planning horizon that looks beyond the individual farm or other single tract, and even beyond group enterprises. A promising economic climate in many areas requires proper use and development of land and water resources on a regional scale.

Programs of this scale require special care in planning for action if high-quality communities of tomorrow are to materialize. Planning must be long range and based on a sound evaluation of existing physical, social, and economic conditions. Planning must consider the needs of agriculture, industry, business, and other interests of people that are in keeping with accepted land use and resource capabilities.

Adequate soil and water information is vital during planning as the base for choosing among land uses. We have adequate land for all of these purposes, but we need to be selective in determining the most appropriate uses of land.

The role of SCS and conservation districts in economic development of communities is increasing. The Watershed Protection and Flood Prevention Program—now about 15 years old—and the Resource Conservation and Development projects are creating new opportunities in and beyond rural America.

New industries providing more and better jobs are coming to communities that have a dependable water supply; flood prevention permits more intensive use of watershed lands for agriculture, forestry, housing, and community facilities; and recreation developments provide opportunities to local residents in their home communities for sports and relaxation. Multiple-purpose watershed reservoirs with municipal and industrial water storage are triggering unprecedented economic growth and full employment in many communities today.

Flood protection, recreational opportunities, and water supplies draw industrial firms to a project area or encourage firms to expand, producing more economic goods and more jobs. Many industries have remained in the community only when assured by local leaders that problems of too much or too little water would be solved. Often these firms are the lifeblood of the community.

Community facilities such as water mains and sewage treatment plants can be properly located once flood hazards have been reduced.

Local processors of farm and forest products have benefited from assured supply and quality of the essential raw materials—made possible through effective application of conservation treatment and modern technology.

Most important, a community effort such as a watershed or RC&D project creates an attitude of cooperation among people who work together on mutual resource problems. This cooperative spirit continues into other community projects essential to economic growth.

The effectiveness of conservation activities or systems involving public or private investments increasingly will be measured in terms of their contribution to improving the quality of life for all people. We need to know more about that contribution and how to measure it:

- Economic activity relating directly to the total conservation investment costs, and those occurring annually;
- Expansion of private conservation investments triggered by public investments;
- The multiplier effect on the economic health of the community; and
- The effect of what we now must term "intangible" benefits that accrue from all our work.

Our aim must be to help communities and regions reach the proper mix of people, natural resources, and capital that will enable them to attract an equitable share of the Nation's industrial, commercial, agricultural, and social well-being.

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They added water for fun . . .

Indiana enjoys first Public Law 566 recreation lake

Montgomery, Ind., has met the challenge and now enjoys the rewards of building a recreation watershed lake.

The lake attracted an equivalent of 17,000 people during the summer of 1967. The sale of season passes to the beach totaled more than $1,200. The concession stand sold out several times, more picnic tables were added to meet the demand, and all 15 campsites were filled when weather was favorable.

The Montgomery Recreation Park is part of the 89,000-acre Prairie Creek Watershed Project in Daviess County authorized for operation in May 1958. The project included 11 flood-prevention structures and about 40 miles of channel improvements.

The idea for a multipurpose dam for recreational use came in 1962 when Public Law 566 was amended to permit 50–50 cost-sharing on recreation facilities. Even with this help, when the Soil Conservation Service presented the Montgomery Town Board, the Conservancy District, and the Daviess Soil and Water Conservation District with an estimate of expenses, town board members decided the community of 350 could not bear the local costs to sponsor the recreation development.

Many citizens were convinced that recreation was needed, however, and drummed up support through the Montgomery Ruritan Club which offered to assume financial responsibility.

The Victor Beard and Noble Thompson families are typical of those who enjoy recreation facilities added to a flood-prevention project.

The Indiana Department of Natural Resources helped finance the cost of additional land and for raising the dam to give the lake capacity for recreation. Construction began in September 1965.

Montgomery Lake was dedicated in less than 2 years, in August 1967, as the first watershed multipurpose recreation lake in Indiana. More than 1,000 local and area people attended, including U. S. Senator Vance Hartke and Congressmen John T. Meyers and William G. Bray.

The recreation area includes a 26-acre lake and a 13-acre park. Other facilities are a beach and bathhouse with concession stand, picnic tables and shelter house, boat dock and launching ramp, camping area and trailer sites with water, electricity, restrooms, shower facilities, and dumping station for travel trailers.

The Ruritan Club manages the park, using the revenue to pay off the $50,000 it raised to meet the local cost. Success of the first season dictated that the club increase the beach area by one-third and add several campsites with water and electric outlets. But the hard-working people of Montgomery do not object to struggling with this kind of success.—JOSEPH C. BRANCO, *work unit conservationist, SCS, Washington, Ind.* ◆